

WHAT WE CLAIM ARE:

1. A vacuum processing system comprising:

a vacuum chamber for defining an inner space capable of being evacuated;

5 a first load-lock mechanism capable of carrying a process object into and out of the vacuum chamber in a state that the vacuum chamber is maintained vacuum;

a second load-lock mechanism capable of carrying a process object into and out of the vacuum chamber in the state that the vacuum chamber  
10 is maintained vacuum;

an external arm disposed outside of the vacuum chamber and being capable of holding the process object and carrying the held process object either into the first load-lock mechanism or into the second load-lock mechanism;

a first robot arm disposed outside of the vacuum chamber and  
15 being capable of transferring the process object between a stock site outside of the vacuum chamber and the first load-lock mechanism and between the stock site and the external arm; and

a second robot arm disposed outside of the vacuum chamber and being capable of transferring the process object between the stock site and the  
20 second load-lock mechanism and between the stock site and the external arm.

2. A vacuum processing system according to claim 1, further comprising:

a buffer disposed outside of the vacuum chamber for temporarily holding the process object,

25 wherein the first robot arm and the second robot arm can carry the

process object from one of them to the other via the buffer.

3. A vacuum processing system according to claim 1, further comprising:

a control apparatus for controlling the first robot arm and the

5 external arm in such a manner that the first robot arm carries a first process object from the stock site to the external arm, thereafter carries a second process object held by the first load-lock mechanism to the stock site, and during a period while the first robot arm carries the second process object, the external arm carries the first process object into the first load-lock mechanism.

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4. A vacuum processing system according to claim 3, wherein the control apparatus controls the first robot arm, the second robot arm and the external arm in such a manner that the second robot arm carries a third process object from the second load-lock mechanism to the buffer, in parallel to this operation the first  
15 robot arm carries a fourth process object from the stock site to the external arm, thereafter the first robot arm carries the third process object from the buffer to the stock site, and in parallel to this operation the external arm carries the fourth process object into the second load-lock mechanism.

20 5. A vacuum processing system according to claim 1, further comprising:

a holding mechanism disposed in the vacuum chamber, the holding mechanism being capable of holding a process object and moving the process object from a process position where the process object is processed to a load position and from the load position to the process position; and

25 an internal arm capable of exchanging a process object at the load

position with a process object held by the first or second load-lock mechanism, while the holding mechanism holds a process object at the load position.

6. A vacuum processing system according to claim 5, wherein the inner arm  
5 comprises a first arm and a second arm both capable of swinging independently, the first and second arms are supported at different positions in a swing axial direction, the first arm swings in a first swing direction to move a process object at the load position to the first or second load-lock mechanism, and at the same time the second arm swings in a second swing direction reverse to the first swing  
10 direction to move another process object from the first or second load-lock mechanism to the load position.

7. A vacuum processing system according to claim 1, further comprising:  
an aligner disposed outside of the vacuum chamber for receiving a  
15 process object from the first robot arm, adjusting a posture of the process object, and passing the process object whose posture was adjusted to the external arm, wherein the external arm receives the process object from the first robot arm via the aligner.

20 8. A vacuum processing system comprising:  
a vacuum chamber for defining an inner space capable of being evacuated;  
a first load-lock mechanism capable of carrying a process object  
into and out of the vacuum chamber in a state that the vacuum chamber is  
25 maintained vacuum;

a holding mechanism disposed in the vacuum chamber, the holding mechanism being capable of holding a process object and moving the process object from a process position where the process object is processed to a load position and from the load position to the process position; and

- 5                    an internal arm capable of exchanging a process object at the load position with another process object held by the first or second load-lock mechanism, while the holding mechanism holds the process object at the load position,

- wherein the internal arm includes a first arm and a second arm both
- 10   capable of swinging independently, the first and second arms are supported at different positions in a swing axial direction, the first arm swings in a first swing direction to move a process object at the load position to the first or second load-lock mechanism, and at the same time the second arm swings in a second swing direction reverse to the first swing direction to move another process object from
- 15   the first or second load-lock mechanism to the load position.